[Proc. Roy. Soc. Victoria, 31 (N.S.), Part II., 1919].

Art. XVII.—*New or Little-known Victorian Fossils in the National Museum.*

Part XXIII.—On some Hydroid Remains of Lower Palaeozoic Age from Monegetta, near Lancefield.

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(With Plates XIX. and XX.).

[Read 12th December, 1918].

Introductory Note.

So far as I am aware no fossils which can be referred to the Hydroid Coelenterates of the Order *Calyptoblastea*, other than the *Dendrograptidae*, have yet been recorded, with some possible exceptions in the Pleistocene. It is rather puzzling to note this fact, seeing how abundant the "Sea-firs" (*Sertulariidae*), the Plumularias and the Campanularias are at the present day. And this is especially so when we take into account the chitinous structure of the hydrosome.

Some forms, however, which have been figured by Ruedemann[1] under the generic names *Chaunagraptus* and *Mastigograptus*, closely approach the present specimens; in fact, one of our species seems referable to the latter genus.

On account of many points of resemblance with hydroids of the Campanularid type, the presently described fossils are referred with little hesitation to this group. Thus the Victorian specimens show an absence of bilateral or radial symmetry which is a distinctive character of the Graptolites, the hydrosome is more irregularly flexuose pointing to a rooted habit, and there is undoubted evidence of gonothecae attached to the hydrosome.

It is only right to mention here that Ruedemann himself, in discussing the general affinities of the graptolites with modern hydrozoa says, in regard to the conical thecae of some of these forms now under notice[2]:—"It can be said that this type of thecae would be more similar to the thecae of the hydrozoans" [sic-

1 Rep. N.Y. State Mus., Mem. No. 11, 1908. Ruedemann.—"The Graptolites of New York," pt. ii., pp. 210-228, pls. ix.-xii.

2 Op. cit., p. 213.

Sertularids and Campanularids] "than any other of the graptolites, first by the basal constrictions, second by the presence of the paired appendages. It has repeatedly been pointed out as an important difference between the graptolites and the hydrozoans that in the latter the point of communication between the hydrothecae and tube of the hydrocaulus is more or less constricted, and in the graptolites the theca is in uninterrupted continuous communication with the coenosarcal canal. . . . I learn from Dr. Ulrich that he also, on finding the material at once recognized its great similarity to the Sertularians and its possible phylogenetic importance."

One of our present types, here referred to, *Archaeocryptolaria skeatsi*, gen. et. sp. nov. might possibly be thought to show affinities with McCoy's *Protovirgularia*,[1] and especially to Ruedemann's tentative reference of some fossils[2] from the Normanskill Shale of Stockport, New York State. The only resemblance, however, between those forms and the Victorian fossil are the straight slender axis and the thecae disposed at right angles to it; but the morphological differences of those thecae are so great as to make a final and close comparison impossible. Thus the thecae in McCoy's oiginal specimens are of the pennatulid type and set serially on the lateral branches, whilst those in Ruedemann's fossils are simple hydrothecae, etc., with extraordinary inflated apices in many cases. These latter fossils are suggested by Ruedemann to have a possible affinity with *Thamnograptus typus*.[3]

For the interesting discovery of these remarkable and wonderfully preserved specimens we are indebted to Prof. E. W. Skeats, D.Sc. They were obtained between 1911 and 1917, and occur in a black slate or shale two miles E.N.E. of North Monegetta, south of Romsey. This slate also contains a brachiopod which I am able to refer to *Acrotreta antipodum*, Chapm., the rock being with little doubt of a similar age to the Lancefieldian of the Mount William and Lancefield districts, from which horizon I have lately described the above-named fossil.[4]

To Mr. Wm. M. Bale, F.R.M.S., I would express my best thanks for his valued opinion on the generic affinities of these interesting fossils and the corroboration of my own conclusions.

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1 *Protovirgularia dichotoma*, McCoy. Ann. and Mag. Nat. Hist., ser. 2, vol. vi., 1850, pp. 272, 273. Id., Brit. Pal. Fossils, 1852, p. 10, pl. ia., figs. 11, 12.

2 ? *Protovirgularia dichotoma*, McCoy. Ruedemann.—"Graptolites of New York," loc. cit., pt. ii., p. 243, pl. x., fig. 9; pl. xi., figs. 8, 9.

3 Loc. cit., p. 244.

4 Proc. Roy. Soc. Victoria, vol. xxx. (n.s.), pt. ii., 1918, pp. 145-148, pl. xxvi.

Description of Fossils.

[The following diagnoses of the specific forms are based on the material to hand, though these may require some further emendation as to specific boundaries and relationships.]

Order CALYPTOBLASTEA. Fam. LAFOËIDAE.

Genus **Archaeolafoëa**, gen. nov.

Generic Characters.—Hydrocaulus slender, flexuous and with few lateral branches. Length about 40 mm. Hydrothecae long-conical, narrowing slightly towards the base; aperture circular; borne equally along the sides of the axis and the branches, and set at angles of 15° to 50°. Periderm transversely wrinkled. Gonotheca small, elongately pyriform.

This generic type resembles the living genus *Lafoëa*, Lamouroux,[1] which is a common form in European and North American waters, and also occurring in the West Indies and the Straits of Magellan. The living specimens of the genus have not yet provided any examples with gonosomes.

Archaeolafoëa longicornis, gen. et sp. nov. (Plate XIX., Fig. 1. 1*a*; Plate XX., Fig. 5).

Description.—Axis of hydrocaulus slender, flexuous. Occasionally with secondary branches. Hydrothecae long, gradually tapering near base and often geniculate. Aperture circular and slightly everted. Periderm of thecae marked with fine transverse wrinkles. Axis scaly. Gonothecae, long-pyriform, shorter than hydrothecae.

Length of hydrosome about 40 mm. Width of axis, .5 mm. Length of hydrothecae about 5 mm. Length of gonothecae about 2 mm.

Observations.—As regards the general form and disposition of the hydrothecae the above species reminds one of *Lafoëa fruticosa*, Sars.[2] The axis in the fossil form is, however, flexible and twisted and does not show the vertical ridging and grooves of the living

1 Expos. Méthod., 1821.

2 Bemaerk, over fire norske Hydroider, Vidensk. Forhandl., 1862. Hincks, Brit. Hydroid Zooph., p. 202, pl. xli., fig. 2. Ailman, Rep. Chall. Zool., vol. xxiii., pt. lxx., 1888, p. 34, pl. xvi., fig. 2, 2*a*.

form. *Lafoëa dumosa*, Fleming sp.[1] compares rather closely with the fossil in its more flexible axis and long-conical hydrothecae.

Genus **Mastigograptus**, Ruedemann.[2]

Note.—The reference to the genus Mastigograptus, of the Victorian species given below, is made in a restricted sense, taking M. tenuiramosus, Walcott sp. as the type.[3]

Mastigograptus is a genus which has occurred in the Utica Slate of Trenton, New York, the equivalent of the Llandeilo Series (Middle Ordovician) of Great Britain. The description of Mastigograptus tenuiramosus, Walcott sp. as given by Ruedemann is as follows[4]:—

"Rhabdosome forming a densely branched bush attaining a size of 20 cm., the branches extremely slender, especially in their long distal portions (.3 mm. average width), given off monopodially and alternatingly small, somewhat irregular intervals (1.5 mm. at an average) and at an angle of 50°; this rather large angle giving the bushes a characteristic shrubby appearance in the central parts [see pl. IX., fig. 2], while the distal parts are inclined to become pendent. The branches are filiform, smooth, as a rule retaining but a central row of circular pits (about 2.2 mm. apart from each other), apparently only on one side of the branch. When perfectly preserved, rows of long conical pedunculate, obliquely ascending appendages, 1.2-1.5 mm. long are observed bearing on their pedunculate bases pairs of similarly shaped, usually shorter and slightly inward curved opposite cones."

Mastigograptus monegettae, sp. nov. (Plate XIX., Figs. 2, 2*a*; Plate XX., Fig. 6).

Description.—Axis moderately straight, occasionally branching. Hydrothecae long, slender and conical; attached to axis by a slender peduncle. Gonothecae not so long as the hydrothecae, long-pyriform and broad near the aperture.

Length of the axis, 23 mm.; thickness, .75 mm. Length of hydrothecae, 8 mm. Length of gonothecae, circ. 4 mm.

Observations.—In the Victorian species the hydrothecae are apparently attached to the axis without the slender pedunculated

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1 *Sertularia dumosa*, Fleming, Edin. Phil. Journ., vol. ii., p. 83. *Lafoëa dumosa*, Fleming sp., Hincks, loc. supra cit., p. 200, pl. xli., fig. 1. Allman, loc. supra cit., 1888, p. 34, pl. xv., figs. 1, 1*a*.

2 Rep. N.Y. State Mus., Mem. No. 11, 1908, p. 210.

3 See Ruedemann, op. cit., p. 216.

4 Loc. cit., p. 216.

base, as in *M. tenuiramosus;* otherwise the shape of the cups are similar. The axis in *M. monegettae* shows less tendency to branch than in *M. tenuiramosus*, but it is difficult to be emphatic on this point on account of the incompleteness of the specimen.

Genus **Archaeocryptolaria**, gen. nov.

Generic Characters.—Hydrocaulus slender, more or less erect or slightly flexuous, length up to about 30 mm. Hydrothecae cylindrical or long-conical, narrowing very slightly towards the base; adnate and attached for some distance along the axis; aperture circular and lip slightly everted. Periderm coarsely wrinkled or scaly. Gonothecae elongately pyriform and incurved to the axis.

This generic type resembles the living genus *Cryptolaria*, Busk,[1] which is practically confined to the Pacific and Southern Oceans.

Archaeocryptolaria skeatsi, sp. nov. (Plate XIX, Fig. 3; Plate XX., Fig. 7).

Description.—Axis flexuous, but not so much as in the preceding species; with a tendency to sigmoidal curvature. Hydrothecae shorter than in *Archaeolafoëa longicornis*, and not so tapering at the junction with the stem, where they are decurrent for some distance and suddenly bent outwards, almost at right angles in the majority of cases. No gonothecae noticed in this form up to the present.

Length of hydrosome about 25 mm. Width of axis, .5 mm. Length of hydrothecae about 2.5 mm.

Observations.—The long cylindrical form of the hydrothecae in this species, together with the geniculate bend after leaving the axis is like that seen in *Cryptolaria angulata*, Bale,[2] a living species found at 100 fathoms in the Great Australian Bight. *Cryptolaria flabellum*. Allman,[3] also shows a strongly flexed hydrotheca, which, however, is curved rather than sharply bent. The periderm in the fossil shows the transverse rings as seen in the living forms.

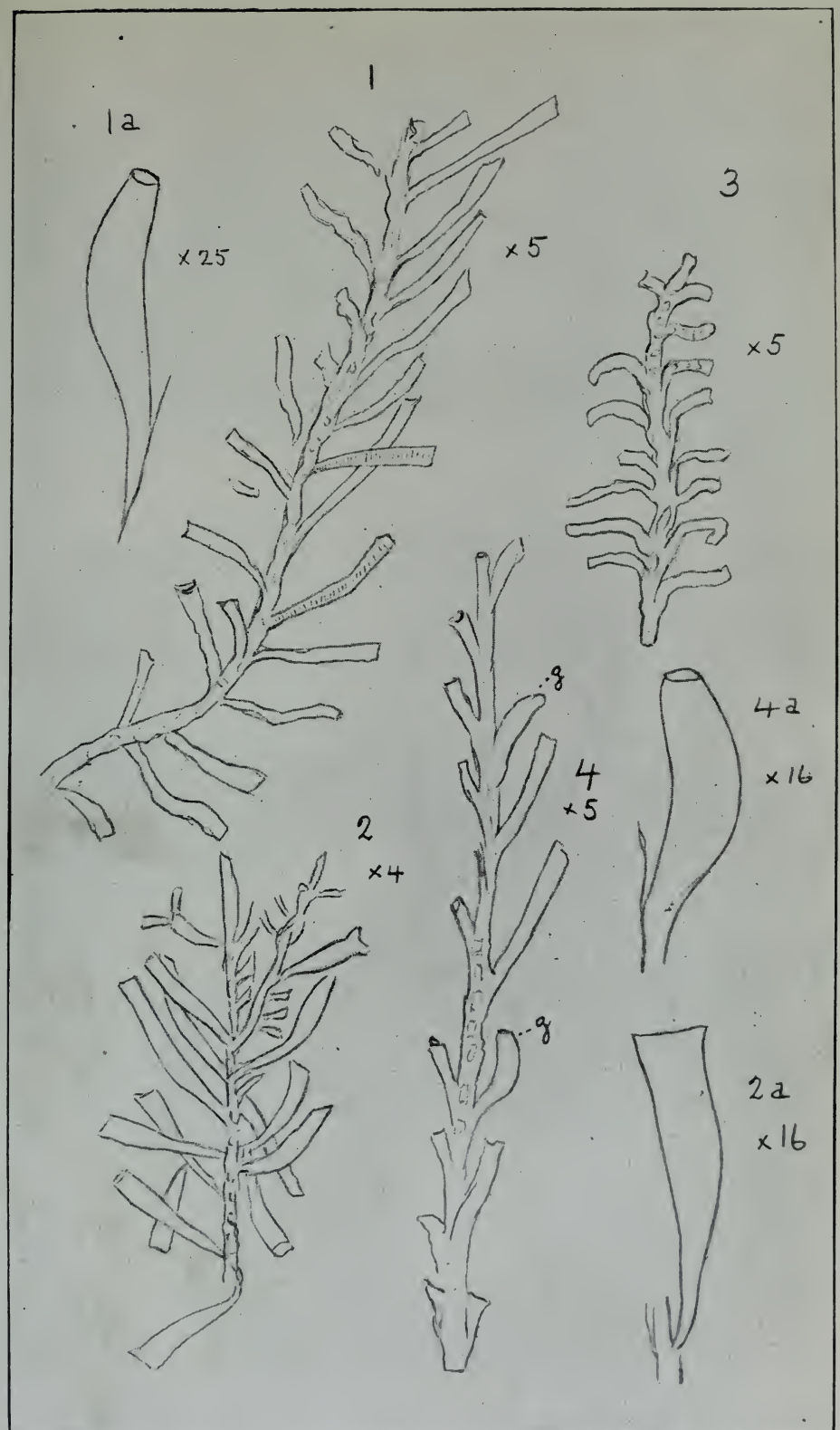
Archaeocryptolaria recta, sp. nov. (Plate XIX., Figs. 4. 4*a*; Plate XX., Fig. 8).

Description.—Axis straight, comparatively stout. No branches in described examples. Hydrothecae long, tapering to base.

1 Quart. Journ. Micr. Sci., ser. i., vol. v., 1857, p. 173. Rep. Chall. Zool., vol. xxiii., 1888. Allman, p. 37. See also this paper, pl. xx., fig. 9.

2 Biol. Results, "Endeavour," vol. ii., pt. iv., 1914, p. 166, pl. xxxv., fig. 1.

3 Rep. Chall. Zool. vol. xxiii., pt. lxx, 1888: Hydroida, pt. ii. p. 40, pl. xix., figs. 1, 1*a*.



F.C. del. ad nat.

Palaeozoic Hydroids: Monegetta, Victoria.